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09/627,147	07/21/2000	Michael F. Cohen	MS1-532US	9962

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EXAMINER	
AMINI, JAVID A	
ART UNIT	**PAPER NUMBER**
2672	13

DATE MAILED: 05/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PR4

Office Action Summary	Application No.	Applicant(s)	
	09/627,147	COHEN ET AL.	
	Examiner	**Art Unit**	
	Javid A Amini	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 23 February 2004.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims JB 5/11/04

4)☑ Claim(s) 1-46 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-15; 18-46 is/are rejected.

7)☐ Claim(s) 16-17 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment

The amendment filed on February 23, 2004, has been considered but is ineffective to overcome the cited reference Keith Walters.

- Applicant on page 15 lines 4-13 argues that is not improper under 35 U.S.C. 112 second paragraph … Examiner agrees with the Applicant argument. That is why rejected under 35 U.S.C. 112 second paragraph. From MPEP 2173.05 ©: Use of a narrow numerical range that falls within a broader range in the same claim may render the claim indefinite when the boundaries of the claim are not discernible. Description of examples and preferences is properly set forth in the specification rather than in a single claim. A narrower range or preferred embodiment may also be set forth in another independent claim or in a dependent claim. If stated in a single claim, examples and preferences lead to confusion over the intended scope of the claim. In those instances where it is not clear whether the claimed narrower range is a limitation, <u>a rejection under 35 U.S.C. 112, second paragraph should be made.</u> The Examiner should analyze whether the metes and bounds of the claim are clearly set forth.

- Applicant on pages 15-16 lines 14-20; 1-14 argues about the Radial basis function and b-spline limitations. The reason for rejecting claim 38 is because; it's depending to rejected claim 37.

  Examiner reply to Applicant 's argument above: Radial basis functions (RBFs) are the natural generalization of coarse coding to continuous-valued features. Therefore what

type of response does the RBFs has? What are the dependent parameters that a person skilled in the art should be concerned about?

Examiner reply to Applicant 's argument above: A B-spline is a generalization of the Bezier curve. Applicant should provide a better understanding of how does the knot vector define control points? How would the Applicant define the curve? Applicant should be able to specifically provide the types (internal/external knots) and uniform B-spline (knots are equally spaced).

- Applicant on page 18 lines 14-18 argues that the reference Waters does not discuss of interpolating or blending existing facial expression to produce a new facial expression. Examiner reply: Applicant should have the response by checking the fig. 10 illustrates the confluence of two muscles. Applicant on page 16 lines 1-2 argues about from the two muscles to produce a third muscle. The reference in fig. 10 illustrates from the interpolation of the two muscles can produce different blending of the two muscles (that Applicant called it third muscle).

- Applicant on page 20 lines 10-20 argues that the heads in Waters are never described as being used to produce another head. Examiner's reply: The reference creates different facial expressions using the mathematical modeled.

- Applicant's arguments on pages 21-25 repeated except for linearly approximate step. Examiner's reply: The reference on page 19, the second and third paragraphs specifies the step that Applicant discloses as Waters does not describe.

- Applicant's arguments on pages 26-30 repeated. Examiner's reply: If Applicant believes an interview help the application go further in process, please call the Examiner at 703-605-4248.

Allowable Subject Matter

Claims 16 and 17 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

1. Claim 16.

The blending method of claim 15, wherein said scaling comprises evaluating a matrix system to ascertain a plurality of scaling weights, individual weights of which are used to scale the radial basis functions.

2. Claim 17.

The blending method of claim 16, wherein said matrix system is configured so that its evaluation yields scaling weights which, when used to scale a corresponding radial basis functions, result in a combination of the radial basis functions and the linear approximation to provide the cardinal basis function

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-15, 19-26, 28-32, 34-36 and 39-46 rejected under 35 U.S.C. 102(a) as being anticipated by Keith Walter (hereinafter, referred as Walter).

3. Claim 1,

Walters in Figs. 16-22 illustrates the step of "providing a set of examples that pertain to a shape or motion that is to be animated, the examples being provided relative to a multi-dimensional

abstract space defined by at least one of an adjective and an adverb", and also cover the limitation of abstract space (an adjective or an adverb). In Figs. 16-12 illustrate a character can be set to be happy or sad or sleep or anywhere is in between.

Walters in Figs. 4-12 illustrates the step of "selecting a point within the multi-dimensional abstract space that does not Coincide with a point that is associated with any of the examples, the selected a point corresponding to a shape or motion within the abstract space". And also see page 20, selecting any point P(x,y) located at a mesh node, within the zone V1 Pr Ps is displaced towards V1 along the vector P V1, this creates P' (x', y').

Walters in Figs. 16-22 illustrates weight values for each of the examples. "Computing a single weight values for each of the examples",

Walters in Figs. 16-22 illustrates the step of "combining the single weight values for each of the examples in a manner that defines an interpolated shape or motion that is a blended combination of each of the examples of the set of examples".

4. Claims 2 and 3,

Walters in Figs. 5 and 6 illustrates by selecting max displacement at the point of attachment to the skin, and at the point of bony attachment zero displacement. Therefore, user does the selection, and the performance is done by an application. "Selecting is performed by an application; and by a game application".

5. Claims 4, 5, and 6

As per claims 4,-6, "Selecting and computing and combining are performed at run time". Walters on page 17 (in introduction paragraph) discloses the storage of the differences between facial positions. This considers for selecting or performing at a run time. But Walters does not

explicitly specify the run time. However, Freeman in Fig. 5, illustrates, which Gaussian distribution provides a useful prior model for how a human moves over time (runtime). And also Freeman teaches in (Col. 10, line 42-46) that an initial estimate of the marker positions for various time frames can be calculated (computing) from the motion estimates from the previous motion segments (combining). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of

6. Claim 7,

Walters in Fig. 5 illustrates clearly a point V1 that can be considered as a cardinal basis for each examples, and can be evaluated by assuming the displacement point to provide the weight value see Figs. 16-22. "defining a cardinal basis for each example; evaluating the cardinal basis for each example relative to the selected point to provide the weight value",

7. Claims 8 and 9

Walters in Fig. 5 illustrates the cardinal basis as V1. And one radial basis portion as Rs and Rf, with another portion showed by P(x,y) that is different from radial basis portion Rs and Rf.

8. Claim 10,

Walters in Figs. 11(c) and 14 illustrates displacement vs 1/f is linear. "Another portion is a linear portion".

9. Claims 11 and 12

The step of "instructions are executed by a computer", is inherent because Walter on page 17 under introduction, mentioned storage of a computer. And also on the same page under motivation third paragraph discloses the step.

10. Claims 13 and 14.

Walter in Figs. 4-12 illustrates the step of, "linearly approximating a degree of freedom that is associated with a new form or motion that is to be rendered based upon a plurality of examples that define respective forms or motions within an abstract space"; Walters in Fig. 5 illustrates clearly a point V1 that can be considered as a cardinal basis for each examples, and can be evaluated by assuming the displacement point to provide the weight value see Figs. 16-22. Especially in Fig. 10 illustrates the confluence of two muscles that clearly illustrates the step of "defining a radial basis function for each of the examples; to combining the linear approximation and the radial basis functions to provide a cardinal basis function; Walter in Fig. 10 or any other Figs. illustrate the linear approximation (non-linear approximation not presented in Walter) and the combination of the linear approximation and the radial basis functions to provide a cardinal basis function, which can be considered as center of two circles. Walter in Figs. 8 and 9 illustrates cardinal basis, and by changing the location of cardinal basis the new form or motion will be appeared, "using the cardinal basis function to render the new form or motion". Also see rejection for claim 34.

11. Claim 15.

Walter in Fig. 5 illustrates (Rf and Rs) the step of "The blending method of claim 13, wherein said defining comprises scaling the radial basis function for each example".

12. Claim 19.

Walter in Figs. 4, 6-10, 12-14 illustrates the step of "The blending method of claim 13, wherein said linearly approximating comprises approximating the degree of freedom with a least squares linear approximation".

13. Claims 20 and 21.

The step of "One or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, implement the method of claim 13", is inherent because Walter on page 17 under introduction, mentioned storage of a computer. And also on the same page under motivation third paragraph discloses the step.

14. Claim 22.

The step of "One or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, cause the computer to: is inherent because Walter on page 17 under introduction, mentioned storage of a computer. And also on the same page under motivation third paragraph discloses the step. Walter in Figs. 4-12 illustrates the step of, " "linearly approximate a degree of freedom that is associated with a new form or motion that is to be rendered based upon a plurality of examples that define respective forms or motions within an abstract space, by deriving basis (Walter in Figs. 4, 6-10, 12-14 illustrates the step of) "hyperplanes that fit a least squares hyperplane to a case where one example has a (Walter in Fig. 1 illustrates a muscle vector displacing a three dimensional grid, than can be represented as a value 1 for the circular cosine falloff and a value 0 for the flat squares hyperplane) value of 1 and the remaining examples have values of 0; account for residuals between the example values and the hyperplane by: Walter in Figs. 4, 6-10 and 12 illustrates the step of "associating a radial basis function with each example; Walter in Fig. 4 illustrates the step of "ascertaining a radial basis weight value for each radial basis function"; and scaling each radial basis function by its ascertained radial basis weight value; Walter in Figs. 8 and 9 illustrates the step of "sum the linear approximation and scaled radial basis functions to provide a cardinal basis function".

15. Claim 23.

Walter in Fig. 10 illustrates the step of "The computer-readable media of claim 22, wherein the instructions cause the computer to perform the recited acts of linear approximation, accounting, and summing for each example to provide multiple cardinal basis functions".

16. Claim 24.

Walter in Fig. 10 illustrates the step of "The computer-readable media of claim 23, wherein the instructions further cause the computer to sum the multiple cardinal basis functions to provide a function that describes the new form or motion within the abstract space".

17. Claim 25.

Walter in Figs. 8 and 9 illustrates the step of "The computer-readable media of claim 24, wherein the instructions cause the computer to select a point on the defined function and render a new form or motion".

18. Claim 26.

Walter in Fig. 5 illustrates the step of "The computer-readable media of claim 22, wherein each radial basis function has a width that is a function of the distance between its associated example and the next nearest example in abstract space".

19. Claim 28.

The step of "A computerized blending system comprising: at least one computer-readable media; at least one processor; instructions resident on the computer-readable media which, when executed by the processor, cause the blending system to:" is inherent because Walter on page 17 under introduction, mentioned storage of a computer. And also on the same page under motivation third paragraph discloses the step. Walter in Figs. 4-12 illustrates the step of, "linearly approximate a degree of freedom that is associated with a new form or motion that is to

be rendered based upon a plurality of examples that define respective forms or motions within an abstract space, by deriving basis (Walter in Figs. 4, 6-10, 12-14 illustrates the step of) "hyperplanes that fit a least squares hyperplane to a case where one example has (Walter in Fig. 1 illustrates a muscle vector displacing a three dimensional grid, than can be represented as a value 1 for the circular cosine falloff and a value 0 for the flat squares hyperplane) a value of 1 and the remaining examples have values of 0; as account for residuals between the example values and the hyperplane by: Walter in Figs. 4, 6-10 and 12 illustrates the step of "associating a radial basis function with each example; Walter in Fig. 4 illustrates the step of "ascertaining a radial basis weight value for each radial basis function; and scaling each radial basis function by its ascertained radial basis weight value; Walter in Figs. 8 and 9 illustrates the step of "sum the linear approximation and scaled radial basis functions to provide a cardinal basis function".

20. Claim 29.

Walter in Fig. 10 illustrates the step of "The computerized blending system of claim 28, wherein the instructions cause the blending system to perform the recited acts of linear approximation, accounting, and summing for each example to provide multiple cardinal basis functions".

21. Claim 30.

Walter in Fig. 10 illustrates the step of "The computerized blending system of claim 29, wherein the instructions further cause the blending system to sum the cardinal basis functions to provide a function that describes the new form or motion within the abstract space".

22. Claim 31.

Walter in Figs. 8 and 9 illustrates the step of "The computerized blending system of claim 30, wherein the instructions cause the blending system to select a point on the defined function and is render a new form or motion".

23. Claim 32.

Walter if Fig. 5, illustrates the step of "The computerized blending system of claim 28, wherein each radial basis function has a width that is a function of the distance between its associated example and the next nearest example in abstract space".

24. Claim 34,

Walters in Figs. 16-22 illustrates the step of "defining a set of examples that pertain to a form or motion that is to be animated, the examples being provided relative to a multi dimensional abstract space", and also cover the limitation of abstract space (adjective or adverb). In Figs. 16-12 illustrate a character that can be set to be happy or sad or sleep or anywhere is in between. Walters in Figs. 4-12 illustrates the step of "examining a plurality of forms or motions that are animated within the abstract space from the defined set of examples", And also see page 20, selecting any point P(x,y) located at a mesh node, within the zone V1 Pr Ps is displaced towards V1 along the vector P V1, this creates P' (x', y').

Walters in Figs. 16-22 illustrates weight values for each of the examples "identifying at least one form or motion that is undesirable", that the invention relates to a system for recognizing (radial basis) of body motion and more particularly to a system for reconstructing an estimate of the 3-dimensional positions of a human body (combination of different portion) from a live or pre-recorded sequence of images of the body. Walters in Figs. 16-22 illustrates the step of, "selecting a form or motion from a location within the abstract space that is proximate a location

that corresponds to the undesirable form or motion". Walter in Figs. 15 and 16-22 illustrates a pseudo-example, "replacing the undesirable form or motion with the selected form or motion to provide a pseudo-example that constitutes a linear sum of the examples of the set of examples".

25. Claims 35-36,

Walter in Figs. 4-12 illustrates the step of, "linearly approximating a degree of freedom that is associated with a new form or motion that is to be rendered based upon the set of examples". Walters in Fig. 5 illustrates clearly a point V1 that can be considered as a cardinal basis for each examples, and can be evaluated by assuming the displacement point to provide the weight value see Figs. 16-22. Especially in Fig. 10 illustrates the confluence of two muscles that clearly illustrates the step of "defining a radial basis function for each of the examples; Walter in Fig. 10 or any other Figs. illustrate the linear approximation (non-linear approximation not presented in Walter) and the combination of the linear approximation and the radial basis functions to provide a cardinal basis function, which can be considered as center of two circles. Walter in Figs. 8 and 9 illustrates cardinal basis, and by changing the location of cardinal basis the new form or motion will be appeared, "using the cardinal basis function to render the new form or motion",

26. Claim 39,

Walter in Fig. 10 illustrates the step of, "defining at least two examples of a form, in a multi-dimensional abstract space, the multi-dimensional abstract space being defined by (Walter in Fig. 15 illustrates the step of "at least one of an adjective and an adverb", a first of the example forms being defined in a first position in the multi-dimensional abstract space and a second of the example forms being defined in a second position in the multi-dimensional abstract space that is

different from the first position; Walter in Figs. 8-14 illustrates the broad step of "computing a form in the first position such that when the computed form is subjected to a transform blending operation that places the computed form in the second position, it will match the second example form".

27. Claim 40,

Walter in Fig. 16 illustrates a rest position. "the first position is a rest position".

28. Claim 41,

Walter in Fig. 17 illustrates, "the first position is a rest position and the second position is angularly displaced from the first position".

29. Claim 42,

Walter in Fig. 15 illustrates the step of, "computing a plurality of vertices associated with the form".

30. Claim 43,

Walter in Figs. 16-22 illustrates, "after computing the plurality of vertices, geometrically blending the computed form in the first position with the first example form in the first position to provide a geometrically blended form in the first position",

31. Claim 44,

Walter in Figs. 15-22 illustrates, "geometrically blending, transform blending the geometrically blended form to provide the form that matches the second example form".

32. Claim 45,

Walter in Figs. 15-22 illustrates, "the example forms pertain to a skeleton-based figure".

33. Claim 46,

Walter in Fig. 10 illustrates the step of, "define at least two examples of a form, in a multi-dimensional abstract space, the multi-dimensional abstract space being defined by (Walter in Fig. 15 illustrates the step of "at least one of an adjective and an adverb", a first of the example forms being defined in a first position in a multi-dimensional abstract space and a second of the example forms being defined in a second position that is different from the first position", Walter in Figs. 8-14 illustrates the broad step of, "compute a form in the first position such that when the computed form is subjected to a transform blending operation that places the computed form in the second position, it will match the second example form",

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 18, 27, 33, 37 and 38 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of

the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 18, 27, 33, 37 and 38 recites the broad recitation "b-spline family", and the claims also recites "radial basis" which is the narrower statement of the range/limitation. Why is the B-spline broad? Because does not specify the type of B-spline (non-periodic/periodic/uniform/non-uniform).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Javid A Amini whose telephone number is 703-605-4248. The examiner can normally be reached on 8-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 703-305-4713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Javid A Amini
Examiner
Art Unit 2672

Javid Amini

Jeffery A. Brier
JEFFERY BRIER
PRIMARY EXAMINER